DISN SDN
WIRELESS BROADBAND IWF
PROOF OF CONCEPT PROTOTPE
FOR MOBILITY ENHANCEMENT
SUPPORT
FOR TACTICAL WARFIGHTER

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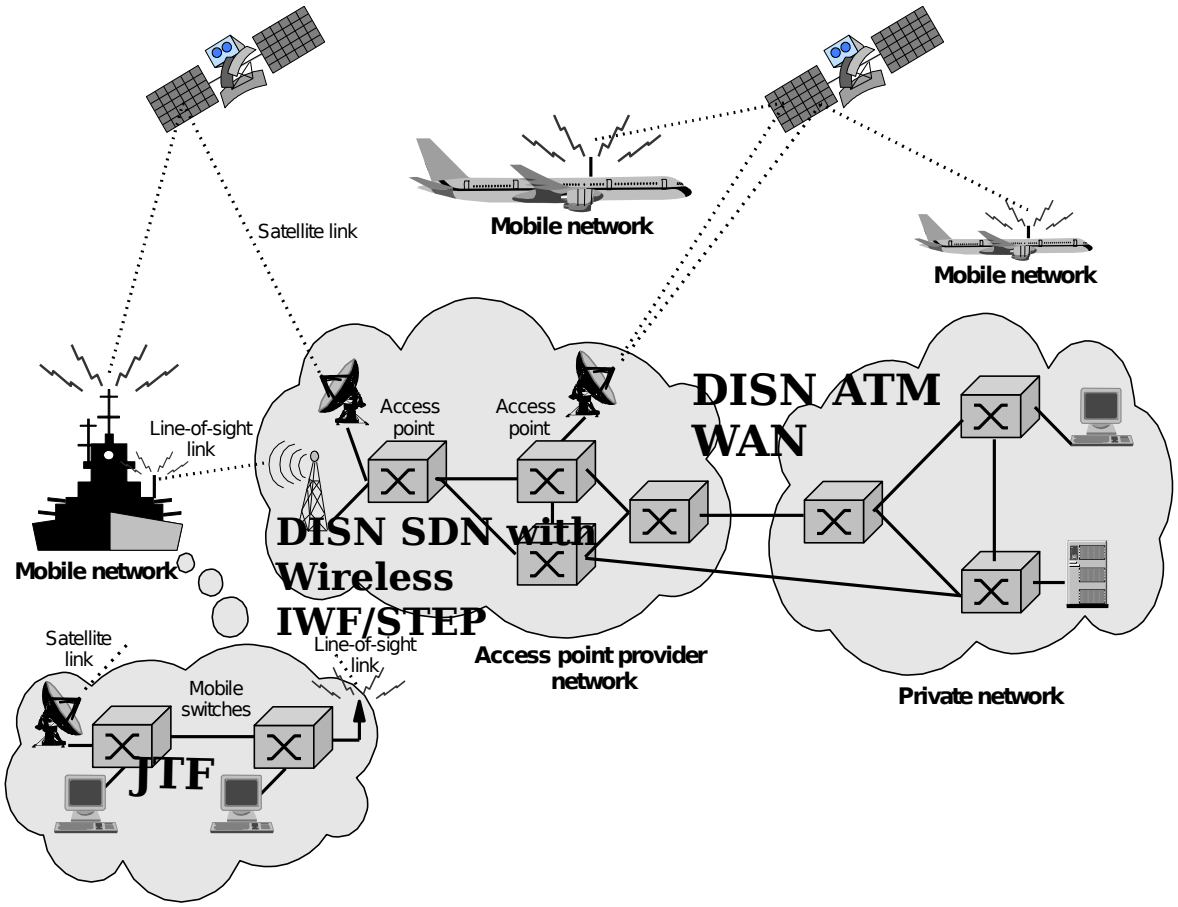
Purpose of Briefing

To inform, discuss and finalize the DISA/ITESO's Engineering Support for the FY00 Joint Mobility Enhancement for Tactical Networking Experiment

Introduction and Background

- An on-going Joint Effort of Army, Airforce, Navy and DARPA sponsored and funded by the USJFCOM JBC/FBL.
- DISA/JIEO/JEEA participated in it since 1999, presented a technical proposal “DISN SDN Wireless IWF for Mobility Enhancement for Tactical Networking” to FBL SSG.
- DISA’s proposal was selected for funding ($150.0 K) and was grouped with the joint FBL Experiment for FY 00.

DISN Global Mobile ATM Services Networking Architecture

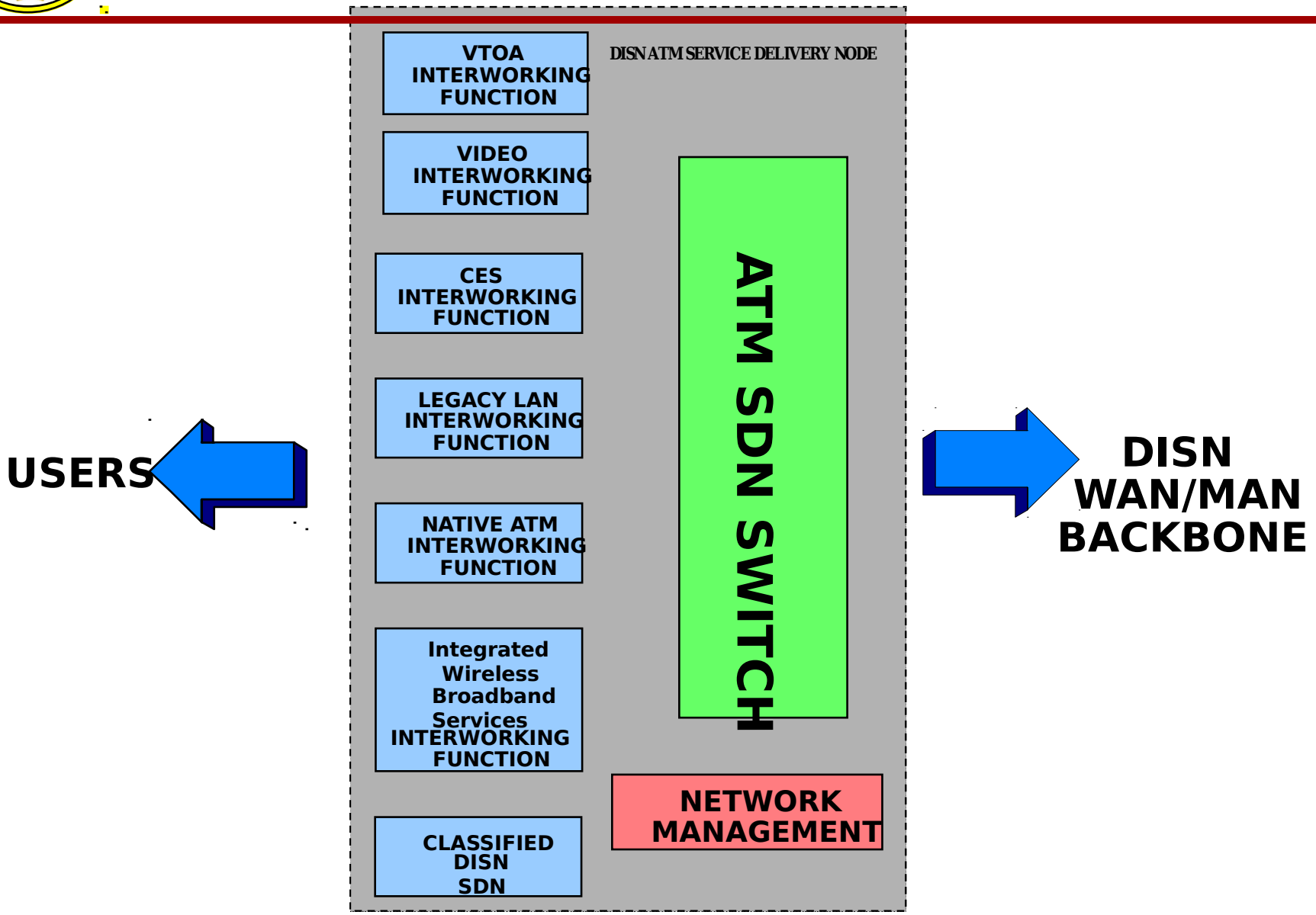


- Demonstrate global end-to-end interoperability between

DISN SDN WITH Wireless Broadband Services IWF

- Provide an Integrated Braodband Wireless extension of DISN ATM Network multimedia (voice, data, video, and imagery) services across network borders.
- Provide standardized Wireless Connectivity and Access Interface (Digital Radio system ie. RF transceivers and antennas) to support DISN ATM Services with QOS parameters from a single network platform.
- Deploy DISN ATM Services/Network in the “ Hot Spots”,
  the areas of civilian disasters and military conflicts where Communications Infrastructure is lacking and/or destroyed.
- Enable interworking of existing and emerging digital wireless systems (Location Independent Switching).
- Provide common service control point; mobility and access management; service creation and service management for the mobile end users.

Global, Mobile DISN
WATM Service Delivery Node



Specific Technical Objectives

The following items will be studied, investigated and demonstrated (Depending on time and resource limitations):

- Understanding and Monitoring the warfighters requirements for the Wireless mobile connectivity.
- Definition, specification and evaluation of new DISN Architecture for offering mobile connectivity (DISN - mobile and fixed networks)
- Conception definition, specifications, design and assessment of DISN SDN Wireless IWF in an end-to-end systems and services environment.
- Integration/interworking from the access (tactical) networks into the DISN SDN.
- Development of Intelligent Networking functions needed to ensure mobility and Ad Hoc Networking (Mobile PNNI,Self Configuring & Self Healing).

Y00 Mobility Enhancement Specific Experiment

- Integration/Interworking:
  - **Core backbone network (JBC, Ft. Gordon, and Reston), an ATM based platform enhanced with Intelligent Networking capabilities for mobility**

(IBM developed Mobile PNNI Extension Specifications that were accepted by the ATM Forum and WATM Switch, N-WAYS, 8265)

  - **With deployed tactical networks (dissimilar air-interfaces and protocols)**
- **Ad Hoc Networking, ATM Mobile Real Time Port Shaping and Call Prioritization (Call Management based on changes in Link Bandwidth, Per Port Call Prioritization)**
- **Dynamic IP Configuration (Proxy PAR & Mobile IP)**
- **An Inter-Working Function:**
  - **to adapt the access network protocols to the DISN,**
  - **to support and manage multiple levels of mobility**
  - **to address multimedia service requirements in terms of QOS and service mobility across different systems.**

Resources Required

- Personnel:
  - 6 Technical Staff Months (BBN under GSA Contract, + $100 K) starting from May 00
  - Syed Shah 50%
  - Bruce Bennett 5%
  - Larry Bowman

- Equipment for DISN SDNs at Fort Gordon and JBC:
  - 2 ASX-200BX
  - 2 Power Hubs
  - 2 NT Workstations (Upgraded)
  - 1 ASX-200BX , Power Hub and 2 NT Workstations (Shared in Reston)

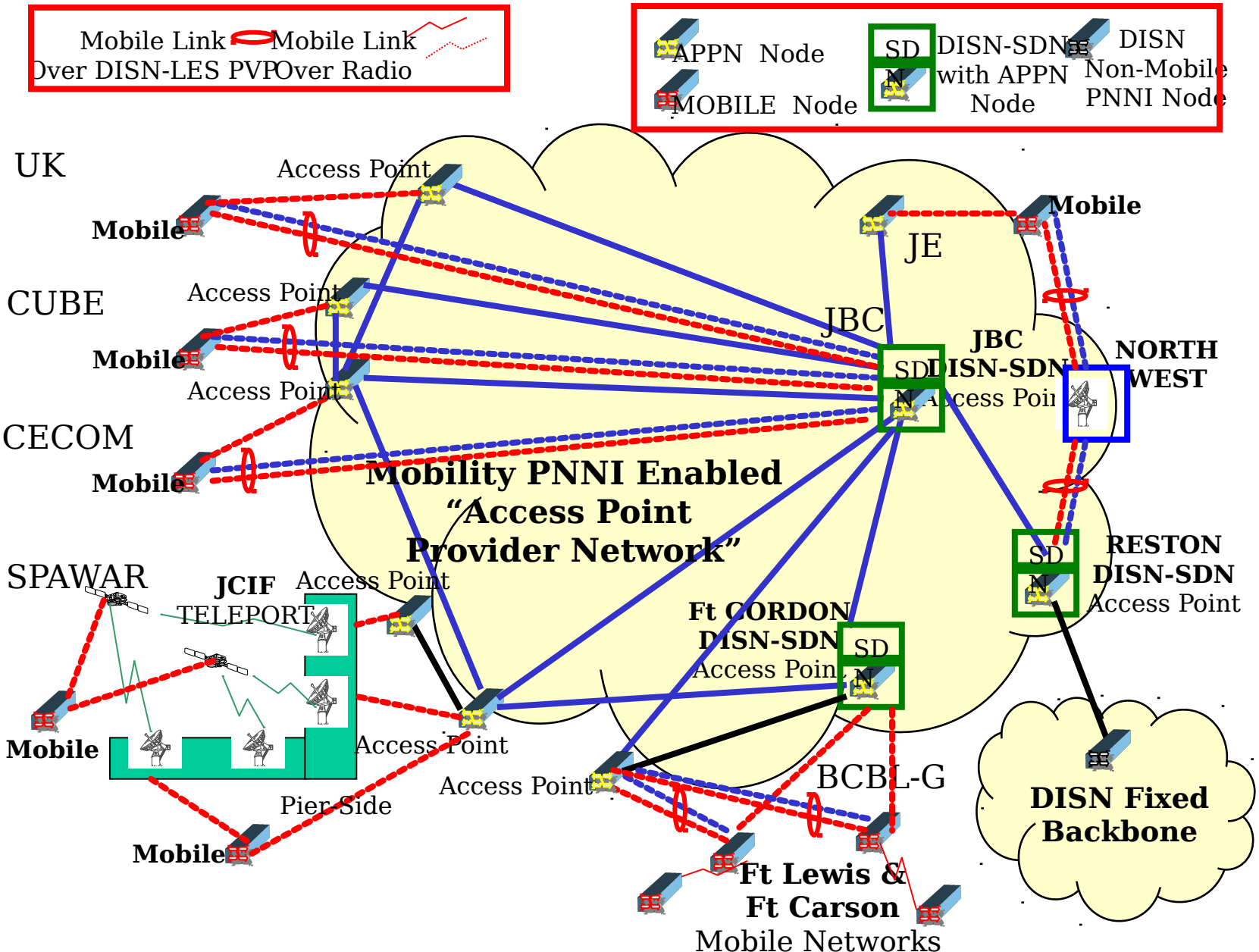
Experiment Schedule

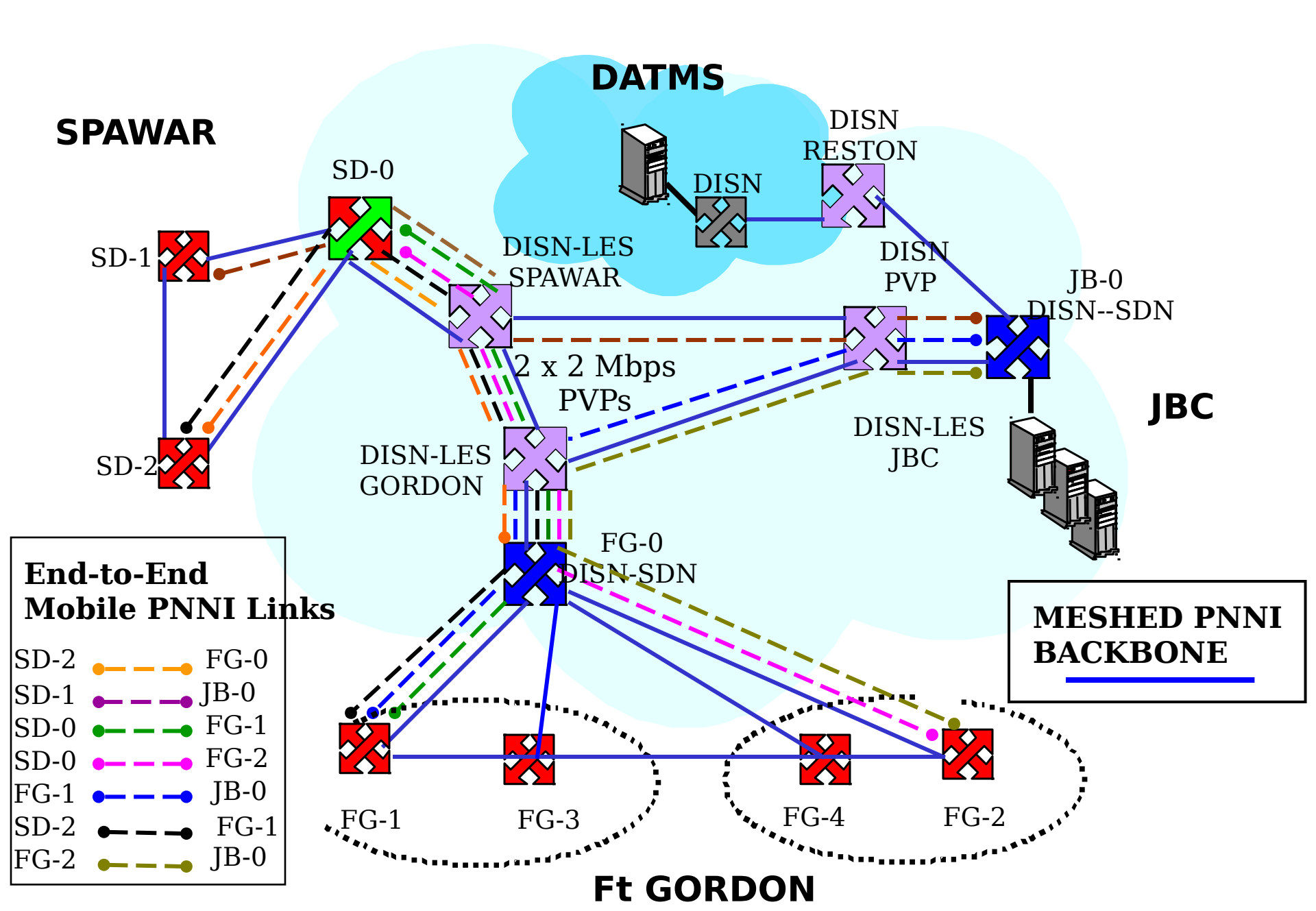
- 28 February 00 MPC MPC Mobile ATM / DISN SDN
- 15 May 00 - FPC Mobile ATM / DISN SDN
- 19 - 30 Jun 00 Mobile ATM / DISN SDN Setup
- 6-29 Jul 00 - Final Combined Experiment
- September 2000 - Final Report

NNI MOBILITY EXTENSION

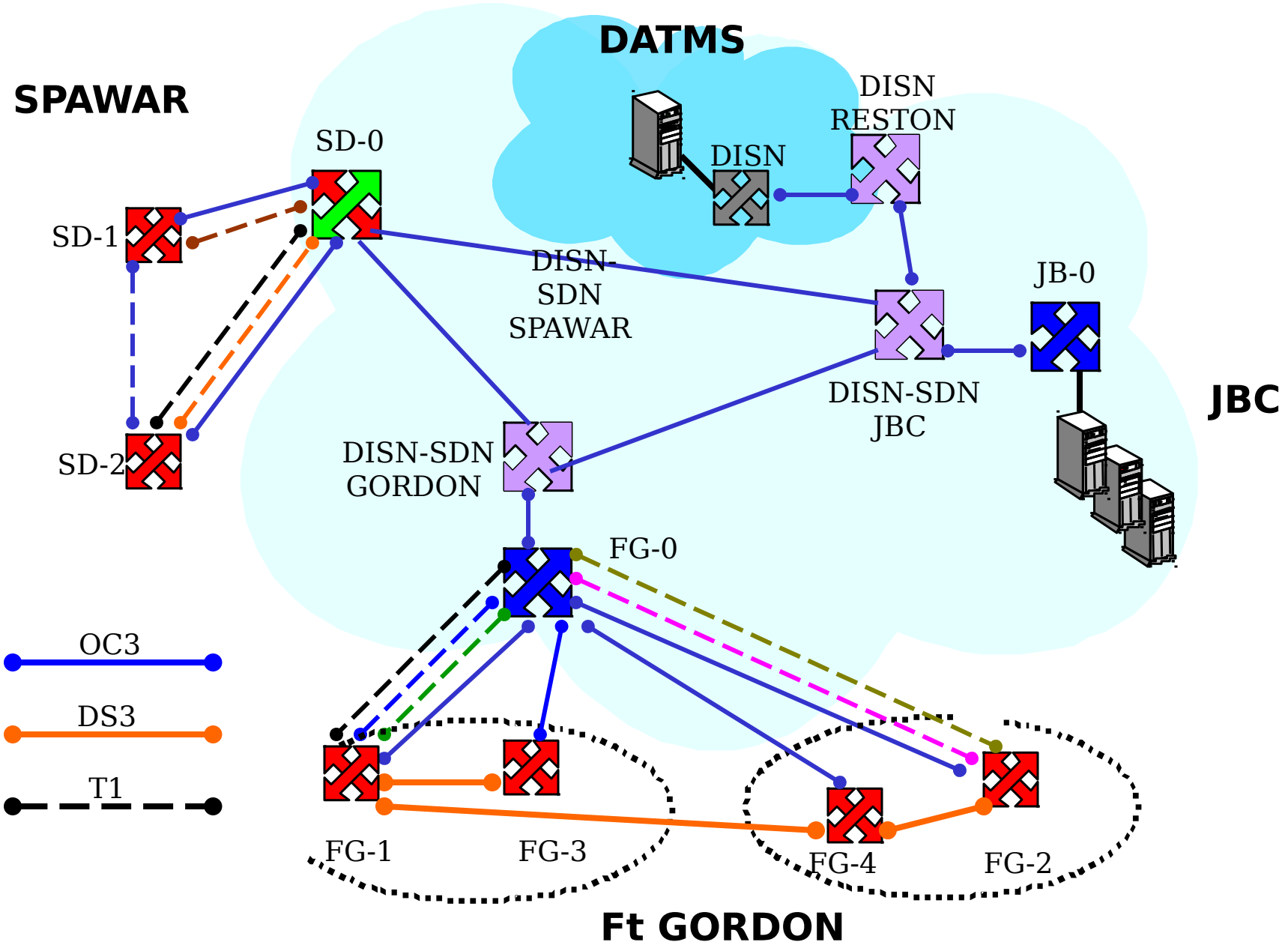
- A new standard called "PNNI mobility extensions (af-ra-0123)" developed by the ATM Forum.
- Became an approved ATM Forum specification in 1999.
- PNNI mobility extensions specification supports automated address resolutions and real-time hand-over of mobile ATM switches.

DISN SDN CONNECTIVITY





ATM / PVP Aggregate Connectivity


DATMS
SPAWAR
DISN
RESTON
DISN
SD-0
SD-1
SD-2
DISN-
SDN
SPAWAR
JB-0
DISN-SDN
JBC
JBC
DISN-SDN
GORDON
FG-0
OC3
DS3
T1
FG-1
FG-3
FG-4
FG-2
Ft GORDON

ATM Addressing Plan Supporting Mobile Adhoc Networking

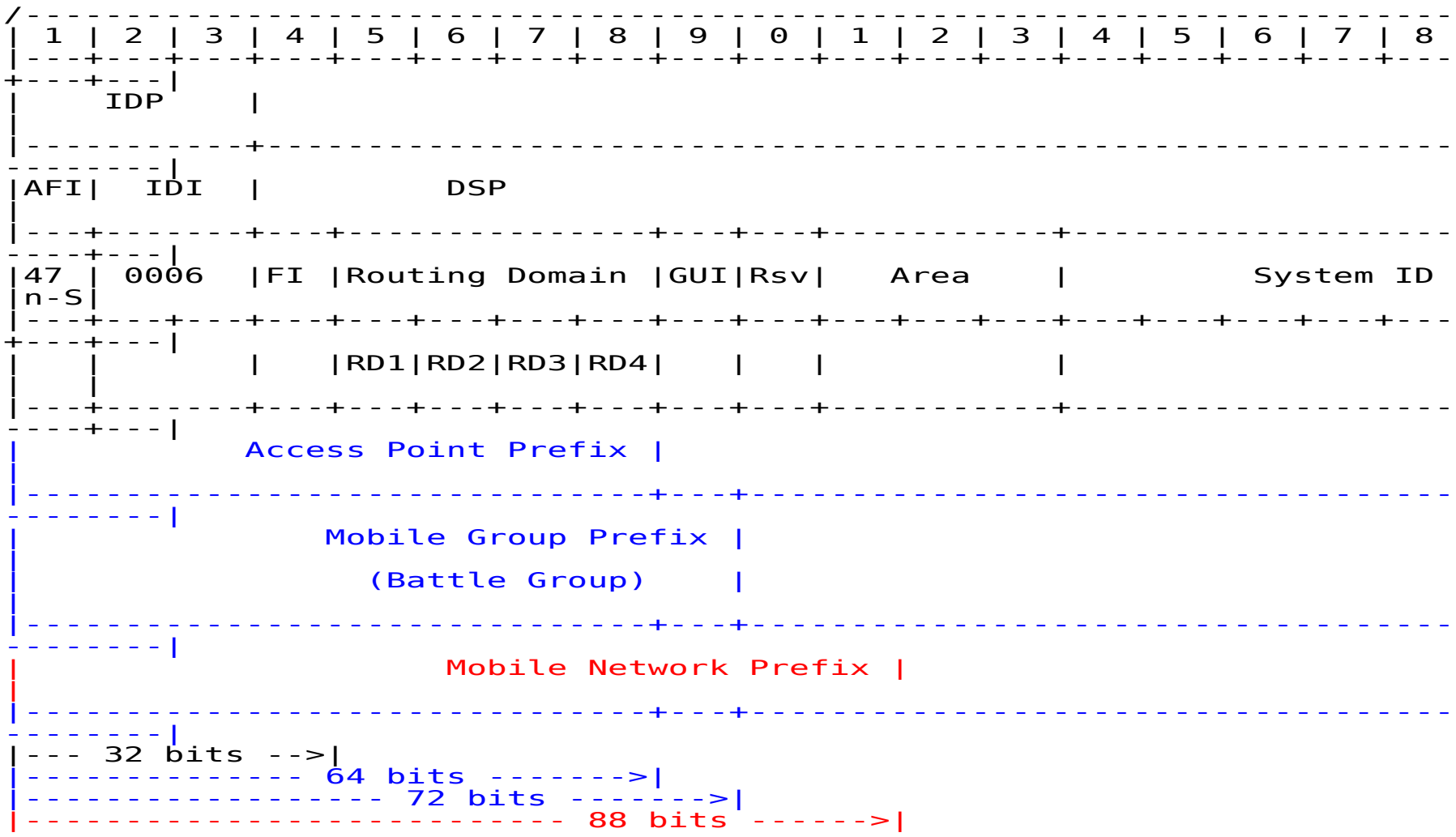


Figure 1. ATM Addresses for Wireless ATM experiments